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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,477	01/05/2006	Kimoon Kim	1751-394	1349
6449 7590 07/24/2008 ROTHWELL, FIGG, ERNST & MANBECK, P.C. 1425 K STREET, N.W. SUITE 800 WASHINGTON, DC 20005				
EXAMINER				
HAQ, SHAFIQTUL				
ART UNIT		PAPER NUMBER		
1641				
NOTIFICATION DATE		DELIVERY MODE		
07/24/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary

Application No.

10/563,477

Applicant(s)

KIM ET AL.

Examiner

SHAFIQUL HAQ

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
4a) Of the above claim(s) 4-9 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-3 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 05 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date 3/28/06
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Election/Restrictions

1. Applicants' election with traverse of Group I, Claims 1-3 is acknowledged. Applicants' election of compound of formula (6) that represents a single species of formula (1) compound is also acknowledged. Formula (6) compound reads on R₁, R₂= C₃ alkylene, R₂=C₄ alkylene, X₁ and X₂= secondary ammonium, Y₁=primary ammonium, Y₂=acrylamide group for formula 3 and cucurbituril wherein R₄, R₅=H for formula 2 in the compound of formula (1) of claim 1 and R₁,R₂,R₃=C₂-C₁₀ alkylene and n=5-10 falls within the scope of the invention.

Applicants' traversal is on the grounds that all the substituent represented by X₁, X₂, Y₁, Y₂, R₄ and R₅ are not functionally distinct and therefore claims 1-3 are not deemed to lack unity of invention.

Applicants' argument have been fully considered but are not found convincing because of the reason of record as set forth in pages 2-4 in the restriction requirement of 3/26/08. The substituent groups such as alkylene, substituted benzene, substituted pyridine and ethyleneglycol polymer for R₁, R₂ and R₃ are structurally divergent and functionally distinct and they are not art recognized equivalents. Substitution groups such as primary amine, acrylamine group, carboxyl group, alkoxysilane group, thiol group, hydroxyl group and cyan group for Y₁ and Y₂ are structurally and functionally divergent and the species are not art recognized equivalents. Similarly, substitution groups such as hydrogen, alkenyloxy group, carboxyalkylsulfonyl group, carboxyalkyloxy group and hydroxyalkyloxy group for

R4 and R5 are structurally and functionally distinct and are not art recognized equivalents and pursuant to PCT rule 13.2 and PCT Administrative instructions, Annex B, Part 1 (f)(I)(B)(2), the species are not art recognized equivalents. Therefore, the species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

2. Accordingly, Claims 4-9 are withdrawn from further consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.
3. Claims 1-3 are examined on merits in this office action to the extent that they encompass the elected invention. The examiner searched the prior art and found art that makes the claims obvious when the search was expanded beyond the elected species (see the following rejection). Therefore, the scope of the claims is restricted to the elected species ONLY and the remaining subject matter withdrawn from consideration.

Claim Objections

4. Claims 1-3 are objected to for reading on non-elected subject matter as a result of the restriction to the elected species ONLY.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. With regard to claim 1, the claim language is confusing as to which compounds are represented by formula 2 and formula 3. Applicants are suggested to re-write the claim to avoid confusion. It is suggested to present formula 1 compound first and then define the structure.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Le *et al* (Agnew. Chem. Int. Ed. 2001).

Lee *et al* disclose a rotaxane compound (see compound 2 in the scheme 1 of page 400), which is very similar or functionally equivalent to the compound of formula (5) on instant claim 3.

The only difference lies in the selection of Y₁ and Y₂ group. In the compound of instant claim 3, Y₁ and Y₂ are primary ammonium group and in the prior art compound the groups are pyridine and they have similar chemical properties because the nitrogen atom on pyridine features a basic lone pair of electrons and because the lone pair is not delocalized into the aromatic pi-system, pyridine is basic with chemical properties similar to primary or secondary ammonium group and therefore, they are functionally equivalent. See for example, claim 2 of instant

application wherein X_1 and X_2 can be selected from either of functionally equivalent secondary ammonium group or pyridinium group.

Similar compounds are expected to have similar properties and the claimed compounds are so closely related structurally to the compounds of the reference as to be structurally obvious therefore in the absence of any unobviousness or unexpected properties.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shafiqul Haq whose telephone number is 571-272-6103. The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Art Unit: 1641

/Shafiqul Haq/
Shafiqul Haq, Ph.D.
Examiner
Art Unit 1641